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Suppliers' Information Note

For The BT Network

BT KiloStream n x 64kbit/s
Service Description

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1. Introduction

This Suppliers Information Note (SIN) describes the n x 64kbit/s KiloStream service using the ITU-T G.703[1] and ITU-T X.21[2] interfaces. It is intended to provide information about this service for terminal equipment manufacturers and developers.

Note: The following speed options were withdrawn from new supply in November 2012 - 192kbit/s, 320kbit/s, 384kbit/s, 448kbit/s, 576kbit/s, 640kbit/s, 704kbit/s, 768kbit/s, 832kbit/s, 896kbit/s and 960kbit/s.

All remaining speed options – 128kbit/s, 256kbit/s and 512kbit/s were withdrawn from new supply in September 2016.

All KiloStream N products (i.e all speeds) were then withdrawn from service completely at the end of March 2020. Reasonable endeavours maintenance support will continue to be provided on existing installations contracted under Emergency Overrun Service extension (EOS extension) terms and conditions, and where technically possible and commercially realistic to do so until circuits are either ceased or withdrawn from the EOS service limited extension completely at the end of July 2026.

2. Service Outline

2.1 General

The service is available nationally and internationally at different capacities.

Note: The following speed options were withdrawn from new supply in November 2012 - 192kbit/s, 320kbit/s, 384kbit/s, 448kbit/s, 576kbit/s, 640kbit/s, 704kbit/s, 768kbit/s, 832kbit/s, 896kbit/s and 960kbit/s.

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2.1.1 National Offering

This offering enables the exchange of synchronous serial binary data at various rates in multiples of 64 kbit/s. This service was first launched offering an n x 64 kbit/s via the ITU-T X.21 interface. As an enhancement to the service, BT intoduced an ITU-T G.703 interface service option.

2.1.2 International Offering

The international service enables the exchange of synchronous serial binary data at various rates in multiples of 64 kbit/s via the ITU-T X.21 interface.

2.2 X.21 Interface

2.2.1 National Offering

The integer "n" is representative of the customer data rate requirement, "n" being the number of 64 kbit/s multiples added together to achieve this (in the range from 2 to 16). The service also provides ways of optionally transporting the customers Control / Indicate interchange conditions through the network. Data framing and synchronisation is provided through the network.

If the Control / Indicate (C/I) conditions are transported then an extra time slot, in addition to the n time slots, will be required i.e. n+1.

2.2.2 International Offering

This offering is the same as that for the national offering with the exception that the range of n is from 2 to 31 without the transport of the C/I conditions, and 2 to 30 including C/I.

2.3 G.703 Interface (National Offering Only)

2.3.1 General

The integer "n" is representative of the number of 64kbit/s channels used within a 2048 kbit/s G.704[3] structured signal. The range of "n" being between 2 and 16. Where transportation of the customers (actual) time slot 0 is required then an extra 64kbit/s channel will be used i.e. n+1. Data framing and synchronisation is provided through the network.

2.3.2 Time Slot Zero Usage

When this option is provided the customer's time slot 0 (CTS0) is transported transparently between the respective customers' termination points.

2.3.3 Time Slot Sixteen (TS16) Usage

The service does not require the CPE to provide TS16 signalling hence the service does not require multiframe alignment and treats TS16 as an ordinary data time slot.

3. Service Availability

Note: The following speed options were withdrawn from new supply in November 2012 - 192kbit/s, 320kbit/s, 384kbit/s, 448kbit/s, 576kbit/s, 640kbit/s, 704kbit/s, 768kbit/s, 832kbit/s, 896kbit/s and 960kbit/s.

All remaining speed options – 128kbit/s, 256kbit/s and 512kbit/s were withdrawn from new supply in September 2016.

All KiloStream N products (i.e all speeds) were then withdrawn from service completely at the end of March 2020. Reasonable endeavours maintenance support will continue to be provided on existing installations contracted under Emergency Overrun Service extension (EOS extension) terms and conditions, and where technically possible and commercially realistic to do so until circuits are either ceased or withdrawn from the EOS service limited extension completely at the end of July 2026.

The KiloStream n x 64kbit/s service was launched February 1989. The n x 64kbit/s (G703) enhancement was launched during December 1993. The KiloStream n x 64kbit/s service, implementing the G.703 120 ohm balanced interface was introduced in January 1997.

4. Technical Specification

4.1 The X.21 interface

4.1.1 Physical

The service offers X.21 access via a 15-way D-type connector mounted on an NTU located at the customer's premises. The attachment to the NTU is via an interface (DTE-NTU) conforming to ITU-T Recommendation X.21 that facilitates full duplex transmission of data at the n x 64 kbit/s rate.

The customer's terminal equipment (DTE) is connected to the NTU irrespective of data rate by means of a connecting cord with 15 way "D" type connector conforming to BS ISO 4903[4].

4.1.2 Electrical (The NTU/DTE Interface)

The interchange circuits used are shown in Table 1:

Table 1 - Interchange Circuits

ITU-T_CIRCUIT DESIGNATION	DIRECTION OF SIGNALLING	CIRCUIT DESCRIPTION	PIN A	PIN B
G	--------	Ground (common Return)	8	-
T	DTE ->- DCE	Transmitted Data	2	9
R	DTE -<- DCE	Received Data	4	11
C	DTE ->- DCE	Control	3	10
I	DTE -<- DCE	Indicate	5	12
S	DTE -<- DCE	Signal Element Timing	6	13
B	DTE -<- DCE	Byte Timing	7	14

A brief description of the function of each interchange circuit is given below. A full description of these circuits can be found in ITU-T Recommendation X.24[5].

Circuit G: Signal ground

Circuit T: Data signals at a rate of n x 64 kbit/s are transferred from the DTE to the NTU.

Circuit R: Data at the originating bit rate (n x 64 kbit/s) is extracted from time slots 1 to n in the incoming 2048 kbit/s signal and transferred from the NTU to the DTE.

Circuit C: The state (ON or OFF) of interchange circuit C is controlled by the customer's DTE and transferred to the NTU for transmission across the network. The ON state indicates that customer's data is being transmitted and OFF indicates other signalling / control data is being sent. The NTU is also able to control the state of "C" for test and fault signalling purposes.

Circuit I: The state (ON or OFF) of the interchange circuit C is controlled by the circuit "C" condition from the distant NTU. An ON state indicates that customer's data is being received from the distant NTU, the OFF indicates other signalling / control data is being received.

Circuit S: The NTU recovers an n x 64 kbit/s clock which is extended to the DTE to provide signal element timing across the interface at all times.

Circuit B: Byte timing pulses are generated by the NTU every eight periods of the n x 64 kbit/s clock and is extended to the DTE.

The electrical characteristics (at all data rates) of the interface are compatible with ITU-T Recommendation X.27 (V.ll)[6] with cable termination in the load. This condition must also apply to the DTE. The Electrical Industries Association equivalent is RS 449 (RS 422A).

4.2 The G.703 Interface

4.2.1 Physical

4.2.1.1 Implementing the G.703 75 ohm Unbalanced Interface

Physically, the digital presentation of the G.703[1] service is via a pair of BNC 75Ω sockets, one for each direction of transmission. The sockets conform to the general requirements of IEC 169-8[7] with the mating dimensions specified in annex B of BS ISO/IEC 10173:1991[8].

4.2.1.2 Implementing the G.703 120 ohm Balanced Interface

Physically, the digital presentation of the G.703 service is a 120 Ohm balanced interface via a socket which conforms to BS EN 60603-7:1993[9] (RJ45 type). The pin out/contact assignment is given in the standard BS ISO/IEC 10173:1991.

4.2.2 Electrical

Electrically, this presentation conforms to ITU-T Recommendation G.703, Section 6. The line code is High Density Bipolar No.3 (HDB3) as defined in G.703, Annex A.

4.2.3 Frame Structure

The frame structure offered over the G.703[1] interface complies with G.704 Section 5[3].

4.2.4 Timing

The service provides the terminal equipment timing.

4.3 Network Terminating Unit (NTU) Power Requirements

Various types of NTU maybe installed, some require a 240 V a.c. mains power source and others require a -50 V d.c. power feed. Power consumption varies, dependent on type of NTU, between 5 Watts and 20 Watts. The -50 V d.c. supply can be provided by BT, or by the customer (see note below). A customer supplied 240 V a.c. mains power source will be required close to the installation to operate either the BT -50 V d.c. power supply or to power the NTU directly depending on the type of NTU.

Where the NTU is powered by a customer provided -50 V d.c. supply, the NTU will be supplied with a connection lead which will be presented as wires only. As power supplies can vary slightly in output voltage and characteristics, the NTU will function with customer provided power supplies which conform to British Telecommunications Network Requirements (BTNR) 2511 [10].

Note:
Customer provided power supplies for connection to this service shall conform with relevant safety standards.

5. Further Information Contact Point

Please contact either:

- Your Company's BT account manager.
- For business customers, BT sales on 0800 800152 for product and service information, sales and rental enquiries.

Enquiries relating to this document should be directed to the SIN helpline which is given on the title page.

6. References

[1]	ITU-T Recommendation G.703 - Physical/Electrical Characteristics of Hierarchical Digital Interfaces.
[2]	ITU-T Recommendation X.21 - Interface between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for Synchronous Operation on Public Data Networks.
[3]	ITU-T Recommendation G.704 - Synchronous Frame Structures used at 1544, 6312, 2048, 8488 and 44 736 kbit/s Hierarchical Levels.
[4]	British Standard BS ISO 4903 - 15 Pole DTE/DCE Interface Connector and Contact Number Assignments.
[5]	ITU-T Recommendation X.24 - List of Definitions for Interchange Circuits between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) on Public Data Networks.
[6]	ITU-T Recommendation X.27 (V.11) - Electrical Characteristics for Balanced Double-Current Interchange Circuits for General use with Integrated Circuit Equipment in the Field of Data Communications.
[7]	British Standard IEC 169-8 - Radio-frequency connectors - Part 8 : R.F. coaxial connectors with inner diameter of outer conductor 6.5 mm (0.256 in) with bayonet lock - Characteristic impedance 50 ohms (Type BNC).
[8]	British Standard BS ISO/IEC 10173 - Integrated Services Digital Network (ISDN) Primary Access Connector at Reference Points S and T.
[9]	British Standard BS EN 60603-7 - Connectors for frequencies below 3 MHz for use with printed boards - Part 7. Detail specification for connectors, 8-way, including fixed and free connectors with common mating features.
[10]	BTNR 2511 - Interface of telecomms equipment with a nominal 48v negative dc power supply.
[11]	ITU-T Recommendation X.150 - Principles of Maintenance Testing for Public Networks using Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) Test Loops.

7. Glossary

BABT	British Approvals Board for Telecommunications
BS	British Standard
BTNR	British Telecommunications Network Requirements
CCITT	The International Telegraph and Telephony Consultative Committee (See also ITU-T)
DTE	Data Terminating Equipment
DCE	Data Circuit Terminating Equipment
HDB3	High Density Bipolar No.3
ISO	International Standards Organisation
ITU-T	International Telecommunications Union for Telecommunications (former CCITT)
NTU	Network Terminating Unit; BT's designation of the device performing the functions of a Data Circuit Terminating Equipment (DCE)
SIN	Suppliers' Information Note

8. History

Issue 1	February 1989	First Issued.

Issue 2	December 1993	Updated.
Issue 3	February 1997	Updated to include a G.703 120 ohm interface; As well as updating the approval requirements at the request of BABT.
Issue 3.1	December 2002	Editorial and document format changes
Issue 3.2	January 2004	Approval Requirements statement removed, information available via SINet Useful Contacts page. Section and reference numbering amended.
Issue 3.3	November 2012	Note added about the withdrawal of some speeds and interface options from new supply
Issue 3.4	February 2015	Note added to provide advance notification of withdrawal from new supply of remaining speeds and interfaces.
Issue 3.5	January 2016	Note added to provide advance notification of full service withdrawal timeframes. Change SINet site references from http://www.sinet.bt.com to http://www.btplc.com/sinet/
Issue 3.6	May 2018	Editorial changes to the notes referencing withdrawal timeframes
Issue 3.7	September 2020	Additional minor phrasing changes in availability text Change SINet site references from http://www.btplc.com/sinet/ to https://www.bt.com/about/sinet
Issue 3.8	September 2023	Minor editorial changes to the note on withdrawal. Reasonable endaeavours maintenance on Emergency Overrun Service extension until end of March 2024. BT registered address changed to One Braham
Issue 3.9	September 2024	Minor editorial changes as EoS extension has a further limited extension until end of March 2025
Issue 4.0	February 2026	Minor editorial changes as EoS extension has a further limited extension until end of July 2026

-END-

ANNEX A - General Information

The information in this annex is offered without prejudice to assist CPE manufacturers in providing maintenance facilities.

A.1 Maintenance

Maintenance facilities are split into manually operated and DCE operated as below:

A.1.1 Manual Operation

Guidance on manually operating test modes / loops etc. is supplied when the service is installed. As NTUs have changed over the years, the operating instructions are particular to the version installed.

A.1.2 Operation From DCE

Operation of test modes from the customer's terminal equipment is as follows:

A.1.2.1 For the X.21 Interface

Test loops 2b & 3c as defined in CCITT X.150[11] and detailed in CCITT X.21[2] are supported.

A.1.2.2 For the G.703 Interface

There are no DCE operated test modes for this interface.